

**REMARKS**

Summarizing this amendment, Claims 5 and 19 have been amended, whereas Claims 1 - 4 and 6 - 18 remain unchanged. Thus, Claims 1 - 19 are again presented for examination.

The amendments to Claims 5 and 19 address the rejection of those claims under 35 USC 112, and are believed to overcome the rejection.

The remaining claims stand unaltered. Of these, Claims 1, 11 and 17 exist in independent condition. All of the claims received favorable consideration in the PCT application from which the present application was converted.

Independent Claim 1 calls for a clutch that includes a cam and a rotor that rotates about an axis, and in addition pistons that project from cavities in the rotor to contact a camming surface on the cam. The claim specifies that the rotor contains a fluid chamber that holds a rheological fluid to which the back faces of the pistons are exposed. Finally, the claim calls for means for varying the viscosity of the rheological fluid. The examiner asserts that the arrangement set forth in Claim 1 is obvious from a consideration of US 5,984,066 (Kurusu) and US 5,988,336 (Wendt). Applicant disagrees.

The Kurisu patent pertains to a transmission having a drum 1 and a shaft 6 that revolve about a common axis 16. The drum 1 contains a cavity that is defined by a surface 3, it being circular and concentric to the axis 16 at one end and either eccentric (Fig. 2) or oblong (Fig. 3) at its other end, with the deviation from concentricity or

elongation from circular, progressing from the one end to the other (while section c-c in Fig. 3 does not appear circular, the text at col. 7, line 47, states that it is).

The shaft 6 projects into the cavity of the drum 1 and within the cavity is fitted with a mechanism for transferring torque from it to the drum. In one variation the transfer mechanism includes a transverse reciprocating shaft 4 having rollers 10 at its ends. Those rollers 10 follow the surface 3 of the cavity. If the rollers 10 operate along the eccentric portion of the surface 3, the shaft 4 will reciprocate when the drive shaft 6 and the driven drum 1 rotate at different velocities. The transverse reciprocating shaft 4 passes through a fluid that does not displace easily with the shaft 4 owing to a baffle 9. As a consequence, the reciprocating shaft 4 imparts rotation to the drum 1. In the other variation, the reciprocating shaft 4 for any pair of rollers 10 is split, so that a void exists between its halves, and that void is filled by a fluid that keeps the opposite rollers 10 against the surface 3, which in this variation assumes an oblong configuration. The half shafts 4 would displace easily were it not for magnets carried by them inducing current in coils 11 that surround the shafts 4. The resulting resistance to movement causes torque to transfer from the longitudinal shaft 5 to the drum 1 (col. 8, lines 59 - 67). Thus, Kurisu relies on a baffle 9 or a coil 11 to resist lateral displacement of the reciprocating shaft 4 and have torque transfer from the longitudinal shaft 5 to the drum 1. Kurisu does not remotely suggest a rheological fluid for controlling slippage between the shaft 6 and drum 1 so as effect a smooth transfer of torque from the former to the latter, but instead relies on varying degrees of eccentricity or elongation of the surface 3

in the drum 1 and with it the displacement of the transfer mechanism axially in the drum 1. As a consequence, the drum 1 occupies considerable space and the mechanism for shifting the transfer mechanism occupies even more space. In short, the transmission of Kurisu is quite long.

The Wendt patent shows a shaft 1 that passes through a housing 3 that encloses a chamber 8. The shaft 1 carries a spoked disc 10 that rotates in the chamber 8 when the shaft 1 rotates relative to the housing 3. The spokes on the disc 10 lie within a rheological fluid that is contained within the chamber 8 of the housing 3, and the viscosity of the fluid is controlled through an electrical current that passes through the fluid. Thus, as the viscosity increases, so does the magnitude of torque that is transferred from the shaft 1 to the housing 3.

It seems inconceivable that one skilled in the art of designing clutches or mechanical transmissions would somehow combine the Kurisu patent and the Wendt patent to produce anything, much less the clutch set forth in Claim 1. Kurisu relies on varying degrees of concentricity or elongation of the surface 3 against which rollers 10 on the ends of reciprocating shafts 4 operate to control the amount of torque transferred. While a fluid is present, it remains constant in viscosity. Indeed, as to the one variation that most appears like applicant's clutch (Fig. 3), the patent states that "the fluid... is not used as a source of resistance to reciprocal motion". (Col. 8, lines 66 & 67). This is just the opposite of the invention set forth in the claims. The Wendt patent transfers torque between two rotating components without any intervening

reciprocal motion. Hence, one skilled in the art would not turn to the Wendt patent for inspiration when seeking to improve the transmission of the Kurisu patent. The two patents rely on totally different and incompatible principles for transferring torque.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. MPEP 2143.01 (III). Indeed, to establish a prima facie case of obviousness, there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. MPEP 2143.01.

Here, no motivation exists in either the Kurisu or the Wendt patents to combine the two by substituting the rheological fluid of Wendt for the nonrheological fluid of Kurisu. After all, what objective would the substitution achieve? The transmission of the Kurisu patent already has the capability to translate between no torque transfer and varying degrees of torque transfer, thus eliminating any motivation to make the substitution.

Moreover, a proposed modification cannot change the principle of operation for a reference. MPEP 2143.01 (VI). Here, the Kurisu transmission varies torque by shifting the follower mechanism 4 axially along the surface 3 that undergoes various degrees of variation from concentricity or circular. By incorporating the Wendt patent into the Kurisu machine, the examiner would eliminate the axial displacement mechanism

Appl. No. 10/529,992  
Amdt. dated April 4, 2007  
Reply to Office Action of January 4, 2007

altogether and thereby change the principle of operation for the Kurisu patent. This is impermissible.

Thus, Claim 1 sets forth a clutch that is not obvious in view of the Kurisu and Wendt patents and meet the requirements of 35 USC 103.

Claim 2 - 7, 9 and 10 depend from Claim 1, and like Claim 1 were rejected for being obvious in view of the Kurisu and Wendt patents. These claims are believed to be allowable for the reasons advanced in the discussion of Claim 1, as are the remaining rejected claims, namely Claims 11, 12 and 14 - 19.

Applicant notes the presence of allowable subject matter in dependent Claim 8 and 13, but they remain dependent in view of the discussion pertaining to Claim 1.

Favorable consideration and allowance of the application with Claims 1 - 19 are respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Edward A. Boeschstein".

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